

What is Claimed is:

1. A portable gas-fired infrared heater comprising:
 - (a) a housing enclosing a burner assembly including a gas valve adapted to receive fuel from an associated fuel supply;
 - (b) said housing at least partially enclosing at least one fuel source;
 - (c) an oxygen depletion monitoring means associated with the burner assembly for automatically shutting off the burner assembly at a predetermined content of at least one gas selected from the group consisting of oxygen, carbon dioxide and carbon monoxide;
 - (d) at least one regulator interposed between said fuel source and said gas valve; and
 - (e) at least one means by which said fuel source and said regulator are moveable between a first use position and a second position in which said fuel source is replaced.
2. The portable heater of claim 1 which further comprises a flexible gas hose interposed between said regulator and said valve.
3. The portable heater of claim 2 wherein said at least one means is at least one pair of rails which telescope between said first and second positions.
4. The portable heater of claim 2 wherein said at least one means is at least one pair of rails which slide between said first and second positions.
5. The portable heater of claim 3 which further comprises a bracket for securing said regulator at the end of said rails.
6. The portable heater of claim 4 which further comprises a bracket for securing said regulator at the end of said rails.
7. The portable heater of claim 2 which further comprises a bracket for securing said regulator, said bracket fixedly secured within a hinged openable door containing said fuel source.
8. The portable heater of claim 2 which further comprises a resilient inwardly-biased clip for positioning about the middle of said fuel source at least partially contained within said housing; and a U-shaped bracket for positioning about the neck of said fuel source.

9. The portable heater of claim 2 which further comprises
 - an outer U-shaped bracket having a pair of arms attached to said frame and having at least one aperture at an end of each arm;
 - an inner U-shaped bracket having a pair of arms attached to said frame and having at least one aperture at an end of each arm; and
 - a cylindrical rod which penetrates through all said apertures in said brackets to permit hinged swinging movement of said regulator which is fixedly secured within said inner bracket.
10. The portable heater of claim 2 wherein said at least one means is a swivelable regulator with a rotatable weighted clip affixed thereto, said weighted clip movable from a first position which prohibit angular rotation of said regulator when said heater is in an upright position to a second position which allows angular rotation of said regulator when said heater is positioned on its back by rotation of said weighted clip into said second position.
11. The portable heater of claim 1 wherein said at least one means is a swivelable regulator rotatable between a pair of arms of a U-shaped bracket fixedly secured to said housing of said heater, said regulator having a gas exit port secured to one end of said bracket, said regulator rotatable on said exit port side by sliding contact engagement with at least one O-ring positioned within a first annular groove about a circumference of said exit port.
12. The portable heater of claim 11 wherein said gas exit port further comprises at least one second annular groove about a circumference of said exit port for a retaining screw.
13. The portable heater of claim 1 wherein said at least one fuel source is at least two one pound propane fuel tanks.
14. The portable heater of claim 13 wherein said at least one fuel source is completely enclosed within said housing.
15. The portable heater of claim 14 wherein said at least two one pound propane fuel tanks are completely enclosed within said housing.

16. The portable heater of claim 15 which further comprises
a controller for selectively switching operation of the portable heater among at least discrete off, pilot, low, and high positions.
17. The portable heater of claim 1 which further comprises
a controller for continuous variable operation of the portable heater.
18. The portable heater of claim 1 wherein
the regulator limits the pressure of an associated fuel source to approximately eleven inches water column.
19. The portable heater of claim 1 which further comprises
a thermocouple that monitors changes in temperature of a pilot flame associated with the radiant surface.
20. The portable heater of claim 1 which further comprises
a shield secured to the housing in overlapping relation to the radiant surface.
21. The portable heater of claim 1 which further comprises
at least one fan to increase air circulation through said heater; and
a power source for said at least one fan.
22. The portable heater of claim 21 wherein
said power source is selected from the group consisting of at least one dry cell battery, at least one battery pack and a power cord configured to plug into a source of electricity.
23. The portable heater of claim 22 wherein
said power source is rechargeable.
24. The portable heater of claim 1 which further comprises
an access means to said at least one fuel source.
25. The portable heater of claim 24 wherein
said access means is a door in said housing.
26. The portable heater of claim 13 wherein
said at least two fuel sources are positioned on one side of said heater.
27. The portable heater of claim 13 wherein
said at least two fuel sources are positioned on a rear side of said heater.
28. The portable heater of claim 13 wherein
said at least two fuel sources are positioned on opposed sides of said heater.
29. The portable heater of claim 13 which further comprises

an igniter for each fuel source.

30. The portable heater of claim 29 which further comprises
a controller for each fuel source.
31. A portable radiant heater comprising:
 - (a) a housing;
 - (b) an air inlet in the housing;
 - (c) a burner assembly mounted in the housing including at least one fuel valve adapted to operatively communicate with at least one associated fuel source and the air inlet; and
 - (d) a radiant surface having a rear face communicating with a plenum chamber and wherein the radiant surface is recessed in the housing; and
 - (e) an oxygen depletion system operatively associated with the burner assembly for automatically shutting off the fuel valve in response to detection of a predetermined level of at least one gas selected from the group consisting of oxygen, carbon dioxide and carbon monoxide.
32. The portable heater of claim 31 which further comprises
at least two fuel valves; and
at least two fuel sources.
33. The portable heater of claim 32 wherein
said radiant surface is angled; and
said plenum chamber is adjacent to the radiant surface for distributing an associated air/fuel mixture over the rear face of the radiant surface.
34. The portable heater of claim 33 wherein
said regulator limits the pressure of the associated fuel source to approximately eleven inches water column.
35. The portable heater of claim 34 which further comprises
a handle; and
a control knob for selecting various modes of operation of the heater, the control knob located in a recess of the housing for limiting inadvertent contact.
36. The portable heater of claim 35 wherein
the heater includes a controller for providing at least 4000 BTUs/hour in a first operative state and at least 9000 BTUs/hour in a second operative state.
37. The portable heater of claim 35 which further comprises

an elongated hose assembly for interconnecting the heater to an associated remotely located fuel source.

38. The portable heater of claim 31 wherein the housing includes at least one cavity dimensioned for receiving at least one associated fuel source therein.
39. The portable heater of claim 31 which further comprises a venturi interposed between the at least one fuel valve and the radiant surface for mixing the associated fuel with air.
40. The portable heater of claim 31 wherein said at least one fuel source is a one pound propane cylinder.
41. The portable heater of claim 40 wherein said at least one fuel source is at least two one pound propane cylinders.
42. The portable heater of claim 31 which further comprises a thermocouple that monitors changes in temperature of a pilot flame associated with the radiant surface.
43. The portable heater of claim 31 which further comprises a shield secured to the housing in overlapping relation to the radiant surface.
44. The portable heater of claim 31 which further comprises at least one fan to increase air circulation through said heater; and a power source for said at least one fan.
45. The portable heater of claim 44 wherein said power source is selected from the group consisting of at least one dry cell battery, at least one battery pack and a power cord configured to plug into a source of electricity.
46. The portable heater of claim 45 wherein said power source is rechargeable.
47. The portable heater of claim 31 which further comprises an access means to said at least one fuel source.
48. The portable heater of claim 47 wherein said access means is a door in said housing.
49. The portable heater of claim 31 which further comprises at least one pivotable fitting for connection to said at least one fuel source.
50. The portable heater of claim 41 wherein

said at least two fuel sources are positioned on one side of said heater.

51. The portable heater of claim 41 wherein
said at least two fuel sources are positioned on a rear side of said heater.
52. The portable heater of claim 41 wherein
said at least two fuel sources are positioned on opposed sides of said heater.
53. The portable heater of claim 41 which further comprises
an igniter for each fuel source.
54. The portable heater of claim 53 which further comprises
a controller for each fuel source.
55. A portable radiant heater comprising:
 - (a) a housing for enclosing said heater and at least partially enclosing at least a one pound fuel source;
 - (b) an air inlet in the housing;
 - (c) a burner assembly mounted in the housing including a fuel valve adapted to operatively communicate with said at least one fuel source and the air inlet;
 - (d) a radiant surface having a rear face communicating with a plenum chamber and wherein the radiant surface is recessed in the housing and disposed at an angle; and
 - (e) an automatic shutoff mechanism operatively associated with the burner assembly for shutting off the fuel valve in response to a detection of a predetermined level of at least one gas selected from the group consisting of oxygen, carbon dioxide and carbon monoxide.
56. The portable radiant heater of claim 55 wherein
the automatic shutoff mechanism includes a thermocouple that monitors changes in a temperature of a flame of the burner assembly indicative of changes in the concentration of a gas selected from the group consisting of oxygen, carbon dioxide and carbon monoxide.
57. The portable radiant heater of claim 56 wherein
the automatic shutoff mechanism shuts off at approximately 100 ppm of carbon monoxide at approximately 18% oxygen levels.
58. The portable heater of claim 55 which further comprises
an igniter secured to the housing for initiating combustion at the radiant surface.
59. The portable heater of claim 55 wherein

the housing is dimensioned to enclose at least an upper portion of said at least one fuel source.

60. The portable heater of claim 59 wherein
said at least one fuel source is at least a one pound propane fuel tank.
61. The portable heater of claim 59 wherein
said at least one fuel source is at least two one pound propane fuel tanks.
62. The portable heater of claim 60 wherein
said at least one fuel source is completely enclosed within said housing.
63. The portable heater of claim 61 wherein
said at least two one pound propane fuel tanks are completely enclosed within said housing.
64. The portable heater of claim 55 which further comprises
a controller for selectively switching operation of the portable heater among at least discrete off, pilot, low, and high positions.
65. The portable heater of claim 55 which further comprises
a controller for continuous variable operation of the portable heater.
66. The portable heater of claim 64 wherein
the controller includes a control knob disposed in a housing recess for protecting against inadvertent contact.
67. The portable heater of claim 55 which further comprises
an extended length hose assembly for connecting the heater to an associated remote fuel source.
68. The portable heater of claim 55 which further comprises
a regulator for reducing pressure from an associated fuel source.
69. The portable heater of claim 68 wherein
the regulator limits the pressure of an associated fuel source to approximately eleven inches water column.
70. The portable heater of claim 55 which further comprises
a thermocouple that monitors changes in temperature of a pilot flame associated with the radiant surface.
71. The portable heater of claim 55 which further comprises
a shield secured to the housing in overlapping relation to the radiant surface.
72. The portable heater of claim 55 which further comprises

at least one fan to increase air circulation through said heater; and
a power source for said at least one fan.

73. The portable heater of claim 72 wherein
said power source is selected from the group consisting of at least one dry cell battery, at least one battery pack and a power cord configured to plug into a source of electricity.
74. The portable heater of claim 73 wherein
said power source is rechargeable.
75. The portable heater of claim 55 which further comprises
an access means to said at least one fuel source.
76. The portable heater of claim 75 wherein
said access means is a door in said housing.
77. The portable heater of claim 76 which further comprises
at least one pivotable fitting for connection to said at least one fuel source.
78. The portable heater of claim 61 wherein
said at least two fuel sources are positioned on one side of said heater.
79. The portable heater of claim 61 wherein
said at least two fuel sources are positioned on a rear side of said heater.
80. The portable heater of claim 61 wherein
said at least two fuel sources are positioned on opposed sides of said heater.
81. The portable heater of claim 61 which further comprises
an igniter for each fuel source.
82. The portable heater of claim 81 which further comprises
a controller for each fuel source.
83. The portable heater of claim 1 which further comprises
at least two wheels extending from a bottom of said housing.
84. The portable heater of claim 83 wherein
said at least two wheels is four wheels, each positioned at a corner of said bottom housing.
85. The portable heater of claim 1 which further comprises
at least two burner assemblies.
86. The portable heater of claim 85 wherein
said at least two burner assemblies are independently controlled.

87. The portable heater of claim 31 which further comprises
at least two wheels extending from a bottom of said housing.
88. The portable heater of claim 87 wherein
said at least two wheels is four wheels, each positioned at a corner of said bottom
housing.
89. The portable heater of claim 31 which further comprises
at least two burner assemblies.
90. The portable heater of claim 89 wherein
said at least two burner assemblies are independently controlled.
91. The portable heater of claim 55 which further comprises
at least two wheels extending from a bottom of said housing.
92. The portable heater of claim 91 wherein
said at least two wheels is four wheels, each positioned at a corner of said bottom
housing.
93. The portable heater of claim 55 which further comprises
at least two burner assemblies.
94. The portable heater of claim 93 wherein
said at least two burner assemblies are independently controlled.

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